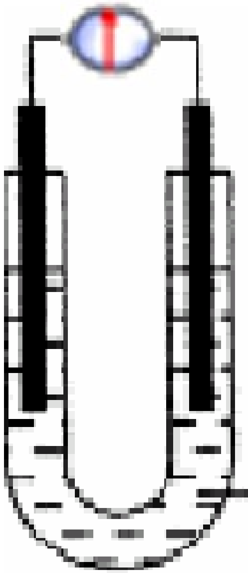
[illegible] [illegible]

[illegible] [illegible]

[illegible] 1

[illegible]	[illegible] $CuCl_2$ [illegible] U [illegible]
[illegible]	[illegible]
[illegible]	[illegible]



[illegible]: [illegible]

[illegible] 2

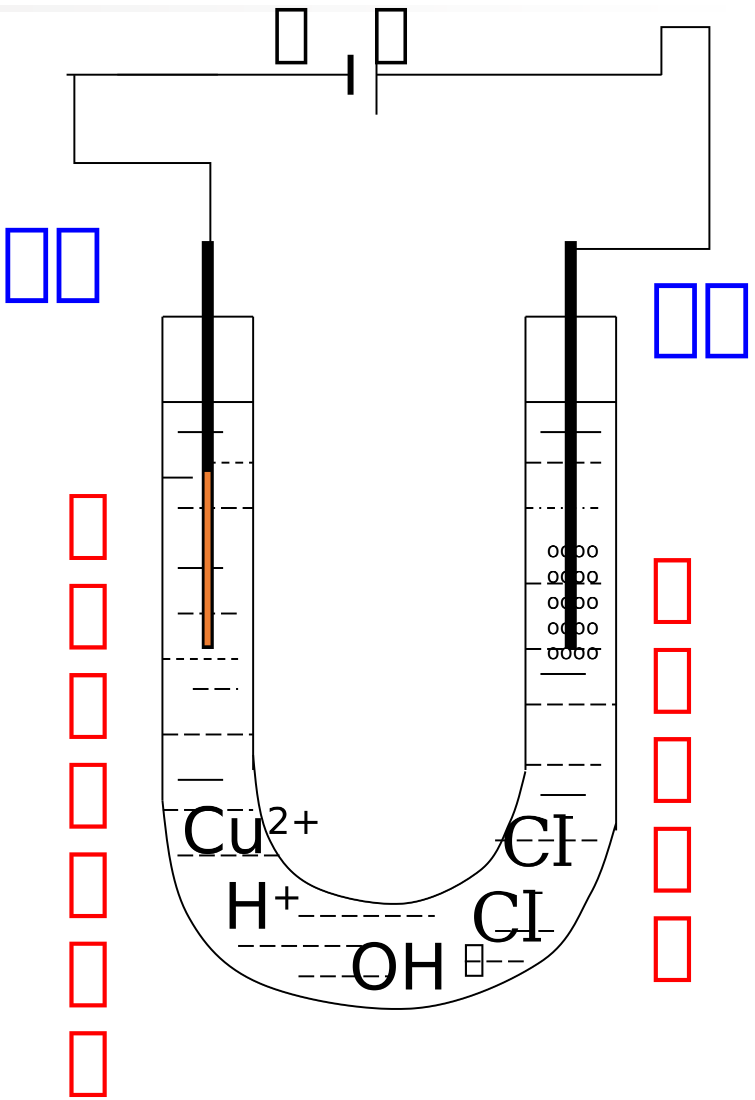
[illegible]

[illegible]

$CuCl_2$ [illegible]

12V [illegible], [illegible]

[illegible] 3 [illegible] 5min [illegible]



A. [illegible]

	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	—————	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

B [illegible]

[illegible]

[illegible] 1 [illegible] ?

[illegible] Cu^{2+} [illegible] H^+ [illegible] Cl^- [illegible] OH^-

[illegible] 2 [illegible]

Cu^{2+} [illegible] H^+ [illegible] Cl^- [illegible] OH^- [illegible]

[illegible] 3 [illegible]

[illegible] $Cu^{2+} \rightarrow Cu$ [illegible]

[illegible] $Cl^- \rightarrow Cl_2\uparrow$ [illegible]

□□□□□

□□□ Cu^{2+} □ $2e^{□}$ = Cu

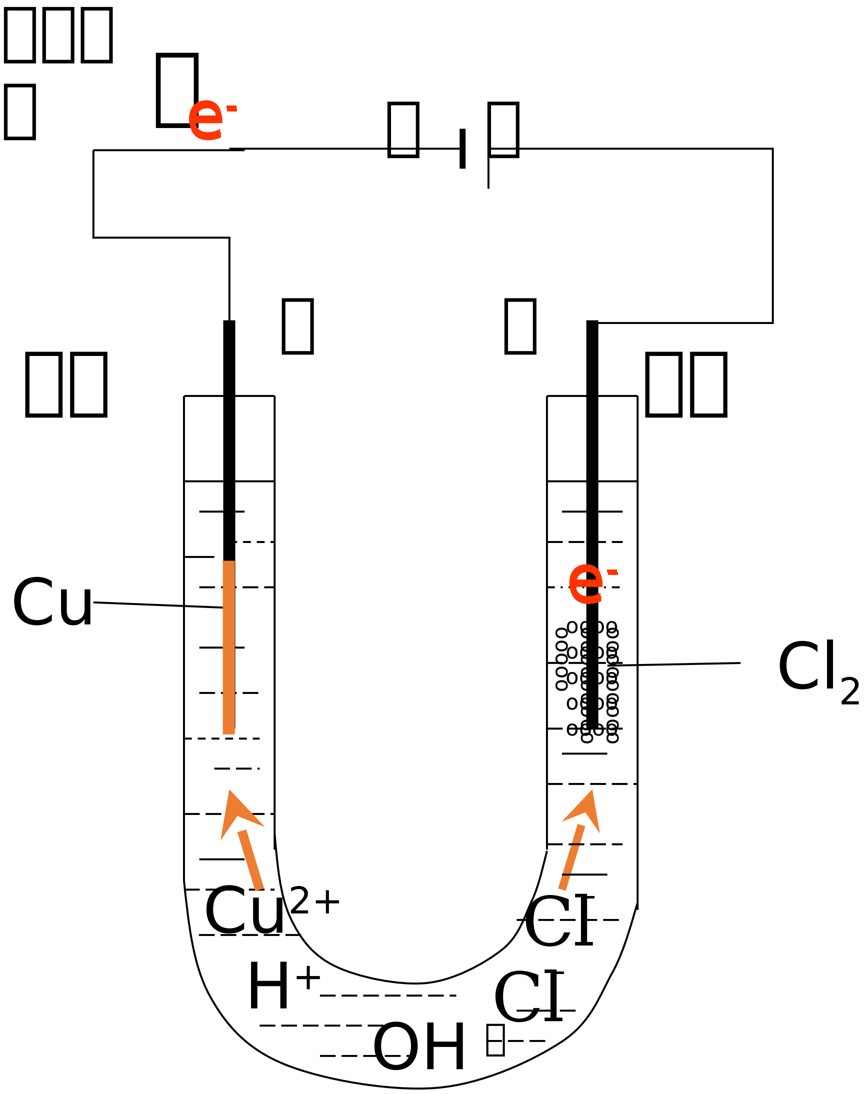
□□□□□□

□□□ $2Cl^{□}$ □ $2e^{□}$ = $Cl_2\uparrow$

□□□□□□

□□□□□

Cu^{2+} □ $2Cl^{□}$ $\xrightarrow{□□/□□}$ Cu + $Cl_2\uparrow$



□□□□□□□□□□□□□□

[illegible]

1. [illegible] [illegible]

2. [illegible] [illegible]

3. [illegible]

① [illegible]

② [illegible];

③ [illegible]

④ [illegible]

□□□

□□□□□

- □□□□□□□—— □□
- □□□□□□□—— □□

□□□□□□

- □□□□□□—— □□
- □□□□□□—— □□

□□□□□

□□

- □□□□—— **Au** □ **Pt** □□□
- □□□□——□ **Au** □ **Pt** □□□□□□

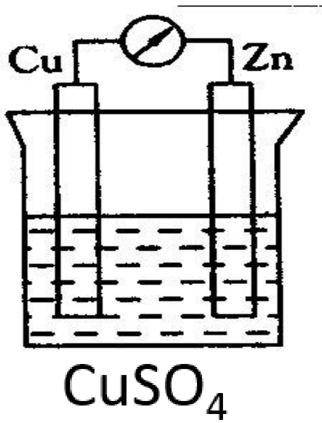
4. [illegible]

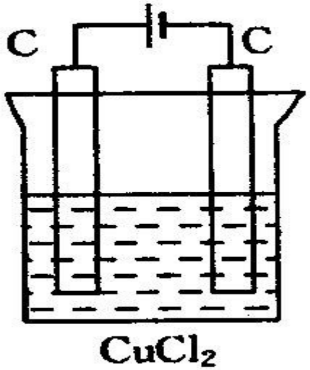
① [illegible]　　[illegible]

② [illegible]　　[illegible]　　[illegible]

③ [illegible]　　[illegible]—[illegible]
[illegible]—[illegible]　　([illegible])

[illegible]





[illegible]

1. [illegible]
2. [illegible]
3. [illegible]

5. [illegible]

[illegible]

① [illegible]——[illegible]

$Ag^{+} > Cu^{2+} > H^{+}$

([illegible]) $> Pb^{2+} > Sn^{2+} > Fe^{2+} > Zn^{2+} > H^{+}$ ([illegible])

$>$ [illegible] $Al^{3+} > Mg^{2+} > Na^{+} > Ca^{+} > K^{+}$ [illegible]

② [illegible]——[illegible]

[illegible] $> S^{2-} > I^{-} > Br^{-} > Cl^{-} > OH^{-} > SO_4^{2-}$ [illegible]

[illegible] Pt [illegible] Au [illegible]

[illegible]

[illegible]

1. [illegible]

2. [illegible] $CuCl_2$ [illegible]

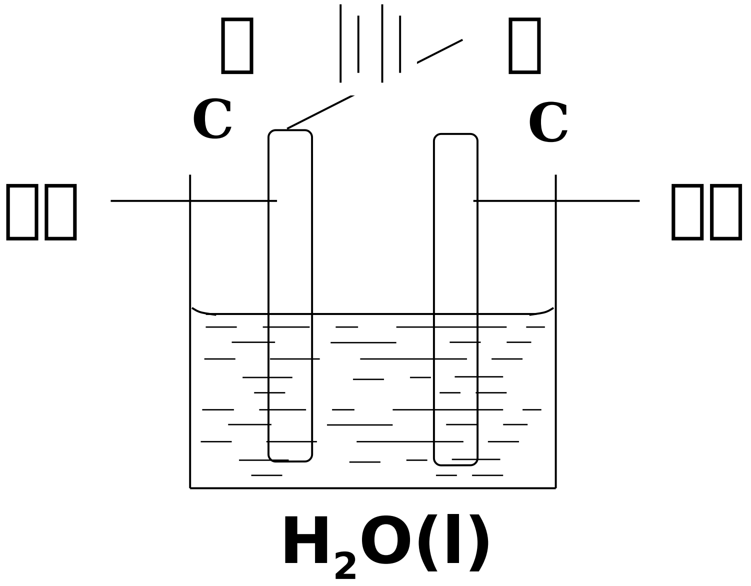
3. [illegible] $NaCl$ [illegible]

4. [illegible] $CuSO_4$ [illegible]

6. [illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
   [illegible]
5. [illegible] pH [illegible]
   [illegible] pH [illegible]



[illegible]“[illegible]”

[illegible] ([illegible])

1. [illegible]

H_2O [illegible]

[illegible] Na_2SO_4 [illegible] H_2SO_4 [illegible] NaOH [illegible]

[illegible] $4OH^- - 4e^- = 2H_2O + O_2\uparrow$

[illegible] $2H^+ + 2e^- = H_2\uparrow$

[illegible] $2H_2O \xrightarrow{\text{[illegible]}} O_2\uparrow + 2H_2\uparrow$

[illegible]

[illegible]________[illegible] [illegible]

[illegible]________[illegible] [illegible]

2. [illegible]

[illegible] (HCl [illegible] HBr [illegible] HI) [illegible]

[illegible] $CuCl_2$ [illegible]

[illegible]

[illegible] 2Cl [illegible] 2e [illegible] $Cl_2\uparrow$

[illegible] $2H^+ + 2e$ [illegible] $H_2\uparrow$

[illegible] 2HCl [illegible] $Cl_2\uparrow + H_2\uparrow$

[illegible]

[illegible] ________ [illegible]

[illegible] ________ ([illegible]

[illegible] HCl [illegible])

3. □□□ □□□□□□□□□□□□□□

□□ **NaCl** □□□ **$CuSO_4$** □□□ **$AgNO_3$** □□□□

① **□ H_2 □□** □□ □□□□□□□□□□□ □□

□□ **NaCl** □□□ **NaBr** □□□□

□□ □ **$2Cl^{-}$ □ $2e^{-}$ □ $Cl_2\uparrow$**

□□ □ **$2H^{+} + 2e^{-}$ □ $H_2\uparrow$**

□□□□ **$2NaCl + 2H_2O$ $\overset{□□}{□□}$ $2NaOH + Cl_2\uparrow + H_2\uparrow$**

□ **$2Cl^{-} + 2H_2O$ $\overset{□□}{□□}$ $2OH^{-} + Cl_2\uparrow + H_2\uparrow$**

□□□□□□□□□□□□□□ ______ □ **HCl**

② [illegible] O_2 [illegible]

[illegible]

[illegible] $CuSO_4$ [illegible] $AgNO_3$ [illegible]

[illegible] $CuSO_4$ [illegible]

[illegible] $4OH$ [illegible] $4e$ [illegible] $2H_2O + O_2\uparrow$

[illegible] $2Cu^{2+} + 4e$ [illegible] $2Cu$

[illegible] $2CuSO_4 + 2H_2O$ [illegible] $2Cu + O_2\uparrow + 2H_2SO_4$

[illegible] $2Cu^{2+} + 2H_2O$ [illegible] $2Cu + O_2\uparrow + 4H^+$

[illegible] ______ CuO [illegible] $CuCO_3$ [illegible]

[illegible]

1.[illegible]

[illegible]

2.[illegible] pH [illegible]

[illegible]

[illegible] pH [illegible]

[illegible]

3. [illegible]

[illegible]

[illegible]

[illegible]1. [illegible] $CuCl_2$ [illegible]

[illegible]

[illegible] Cu [illegible] H_2

[illegible] Cl_2 [illegible] O_2

[illegible]1. [illegible] $CuSO_4$ [illegible] NaCl [illegible]

[illegible]

① Cu^{2+} [illegible] $2Cl^{-}$ == $Cu + Cl_2\uparrow$ ([illegible])

② $2Cu^{2+} + 2H_2O$ [illegible] $2Cu + O_2\uparrow$ ([illegible])

$+4H^{+}$ ([illegible])

③ $2H_2O$ [illegible] $O_2\uparrow + 2H_2\uparrow$

□2. □□□□□□□□0.2mol $CuSO_4$□□□□□□□□□□
□□□□□□□□2.24L□□□□□□□□□□□□□□
□□□□□□□□□________□□□□□□

0.2mol CuO

□□2. □□□□□□“□□□□□□□4.48L□□”□

① 0.2mol CuO+0.2mol H_2O

□② 0.2mol $CuCO_3$+0.2mol H_2O

□③ 0.2mol $Cu(OH)_2$

[illegible]

1 [illegible]

[illegible] U [illegible]

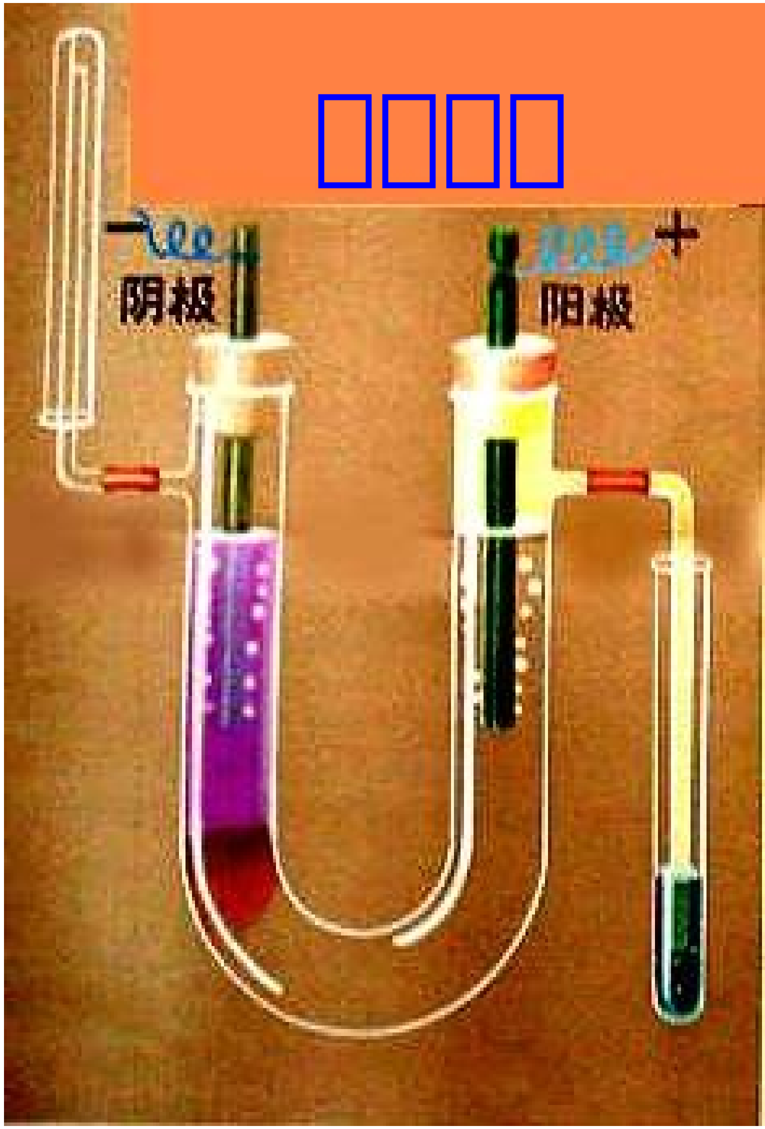
[illegible]

[illegible]:

[illegible] 1 [illegible]? [illegible]

[illegible]?

[illegible] 2 [illegible]

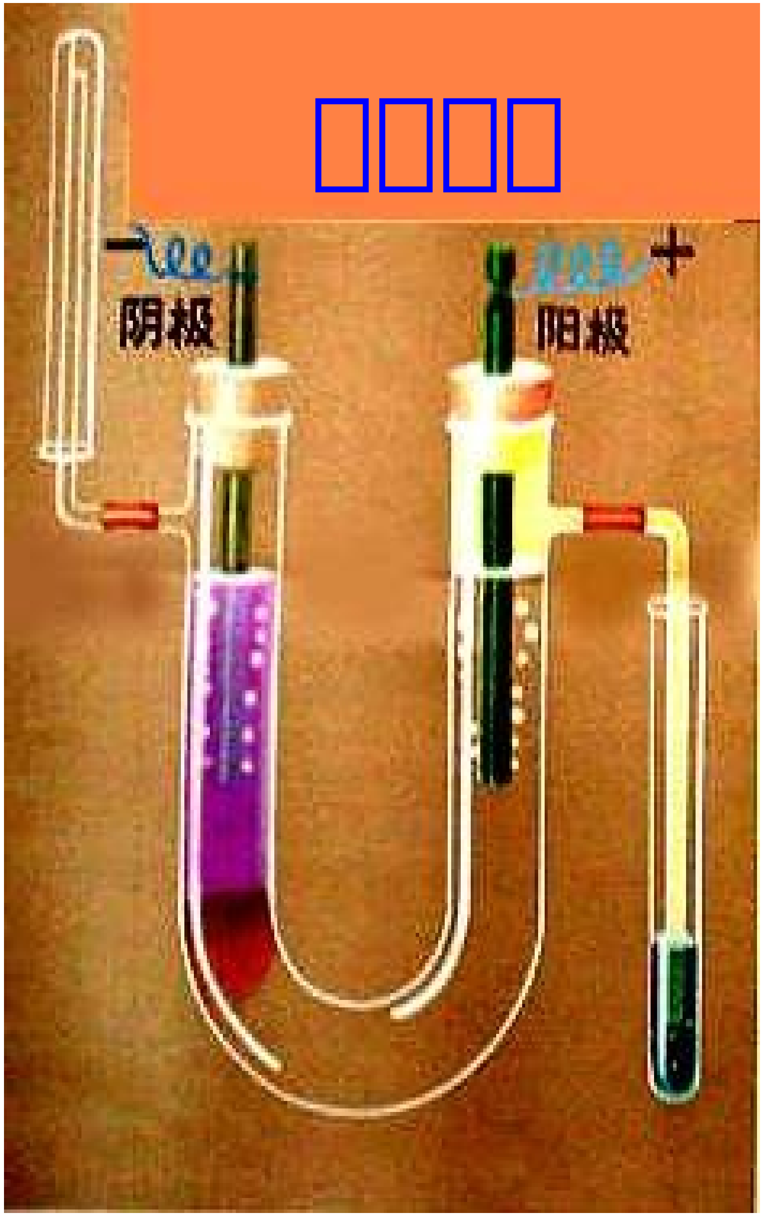


[illegible]

[illegible]

[illegible] KI [illegible]

[illegible]



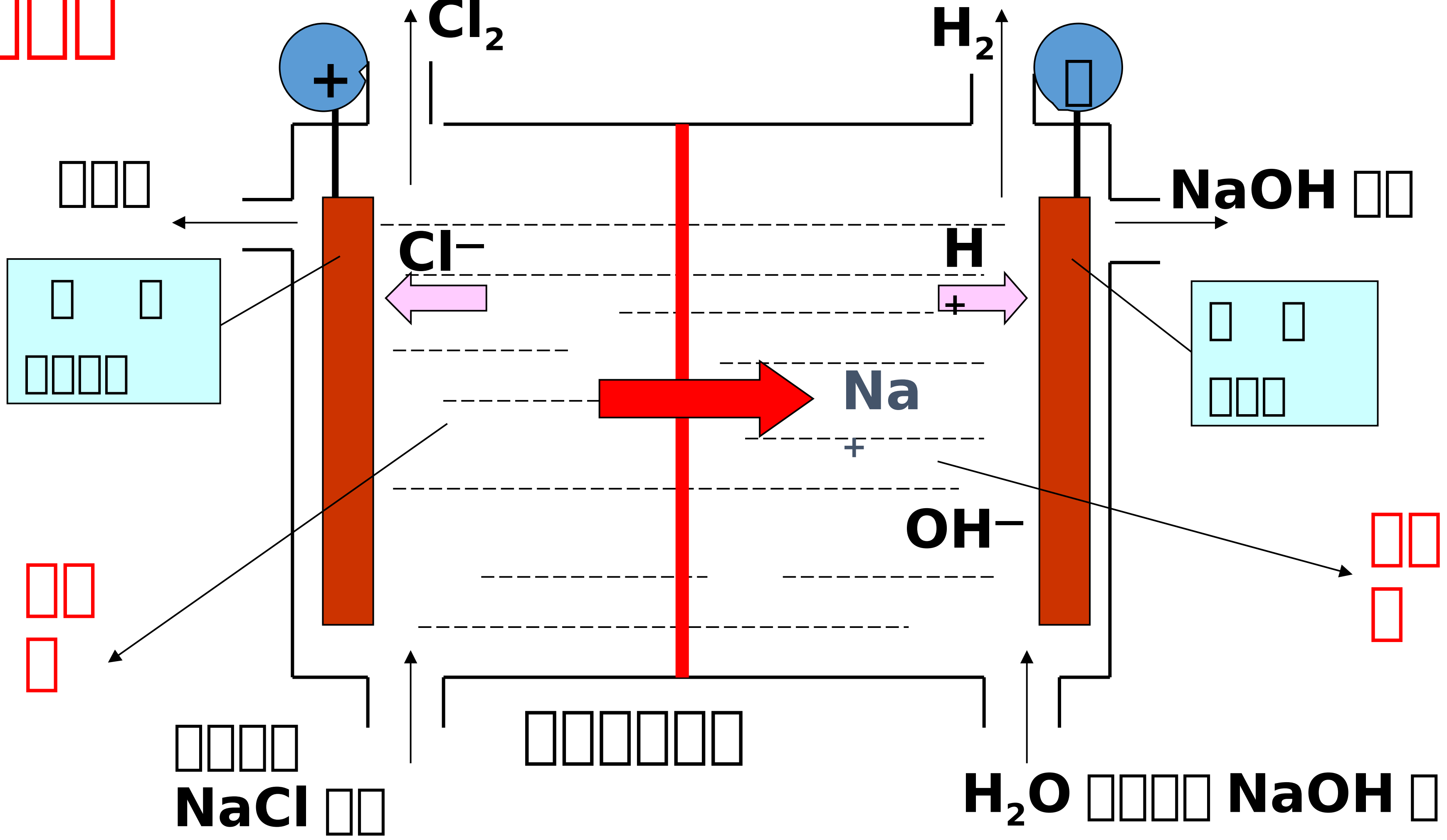
[illegible] $2Cl^{-}-2e^{-} = Cl_2\uparrow$

[illegible] $2H^{+}+2e^{-} = H_2\uparrow$

[illegible] $H_2O+2e^{-} = H_2\uparrow+2OH^{-}$ [illegible]

[illegible]

$2NaCl+2H_2O==2NaOH+H_2\uparrow+Cl_2\uparrow$

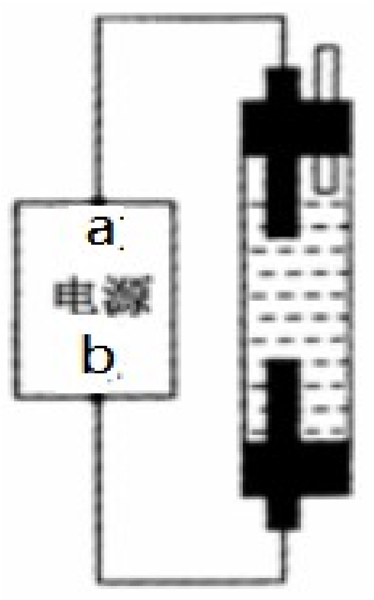


a

b

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□NaCl□
□□□□□□□□Cl_2□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□□□□□□□□□□□□□□□□□□□□□□□□　　　□

D



A□a□□□□b□□□□NaClO□NaCl

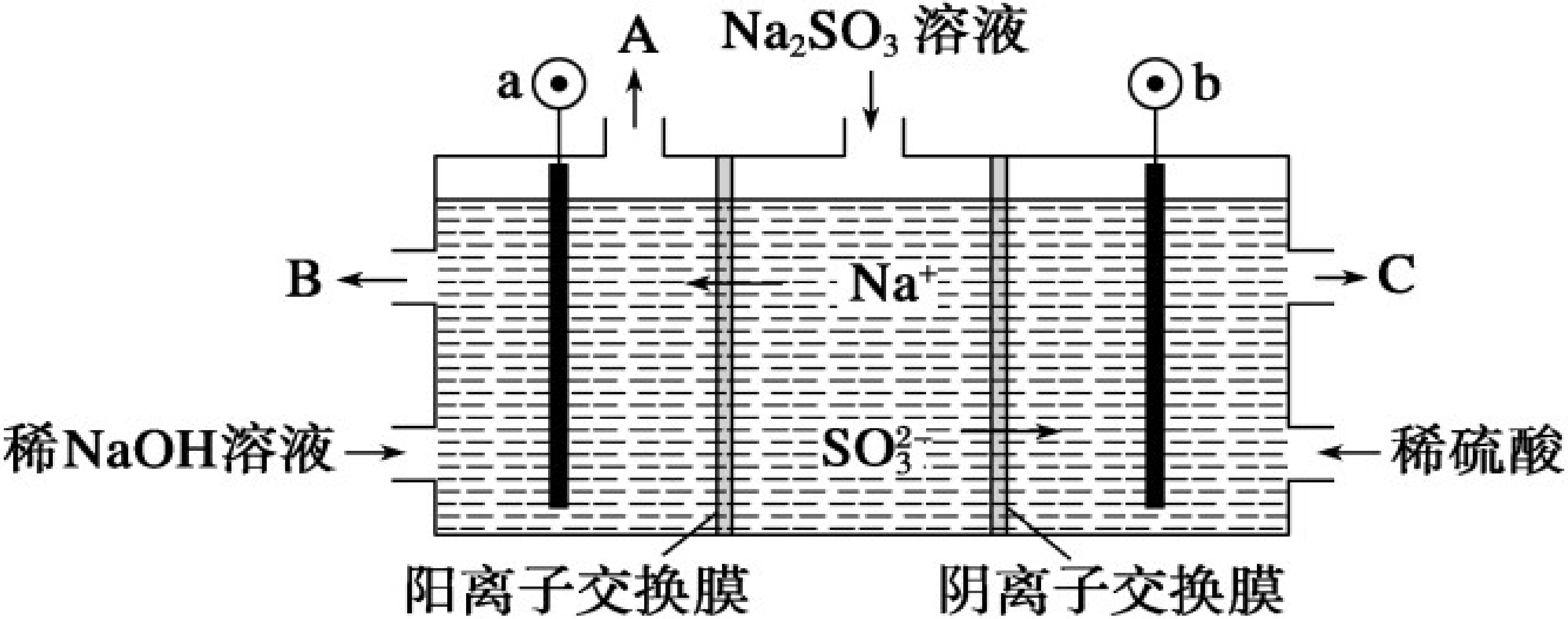
B□a□□□□b□□□□HClO□NaCl

C□a□□□□b□□□□HClO□NaCl

D□a□□□□b□□□□NaClO□NaCl

2 □□ NaOH □□□□□□□□ SO_2 □□□□□ Na_2SO_3 □□□□□□□□
□□□□ NaOH □□□□□ H_2SO_4 □□□□□□□□ (□□□□□□□) □□
□□□□□□□□□□□ □

B



A □□□ a □□□□□□□□

B □ A □□□□□□□□□□ C □□□□□□□□□

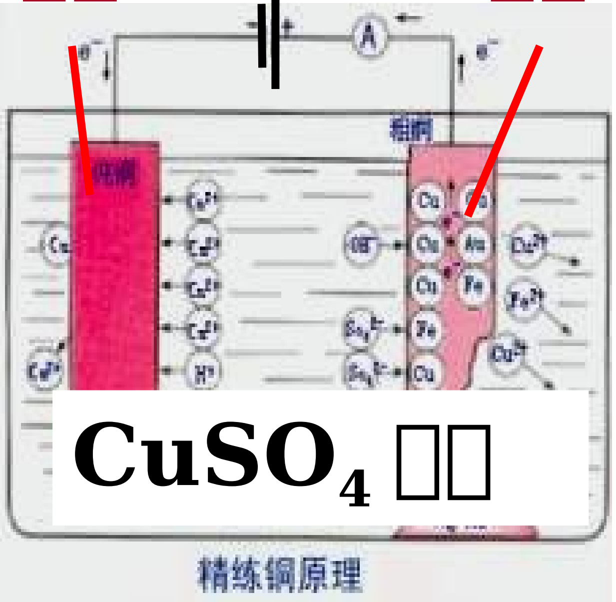
C □ b □□□□□□□□ $SO_3^{2-}-2e^-$ □ $H_2O===SO_4^{2-}$ □ 2H □

D □□□□□□□□□□□□□□□□

2 [illegible]

[illegible] [illegible] (Zn Fe Ni Ag Au Pt [illegible]

[illegible] [illegible]



[illegible]

$Zn - 2e^- \rightarrow Zn^{2+}$

$Fe - 2e^- \rightarrow Fe^{2+}$

$Ni - 2e^- \rightarrow Ni^{2+}$

$Cu - 2e^- \rightarrow Cu^{2+}$

Cu, Ag } [illegible] ↓

Au

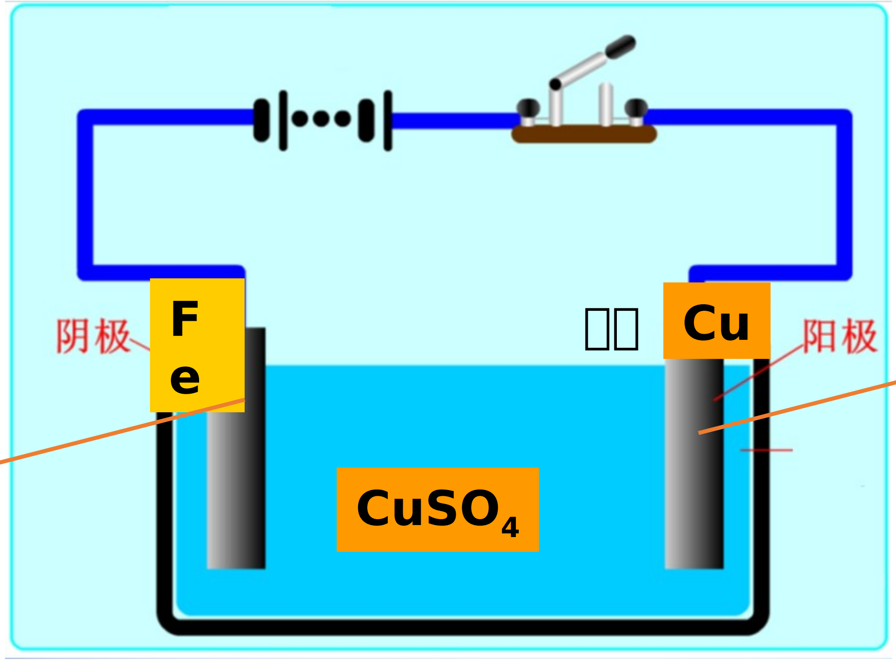
Pt

[illegible]: $Cu^{2+} + 2e^- \rightarrow Cu$

[illegible] 1. [illegible]

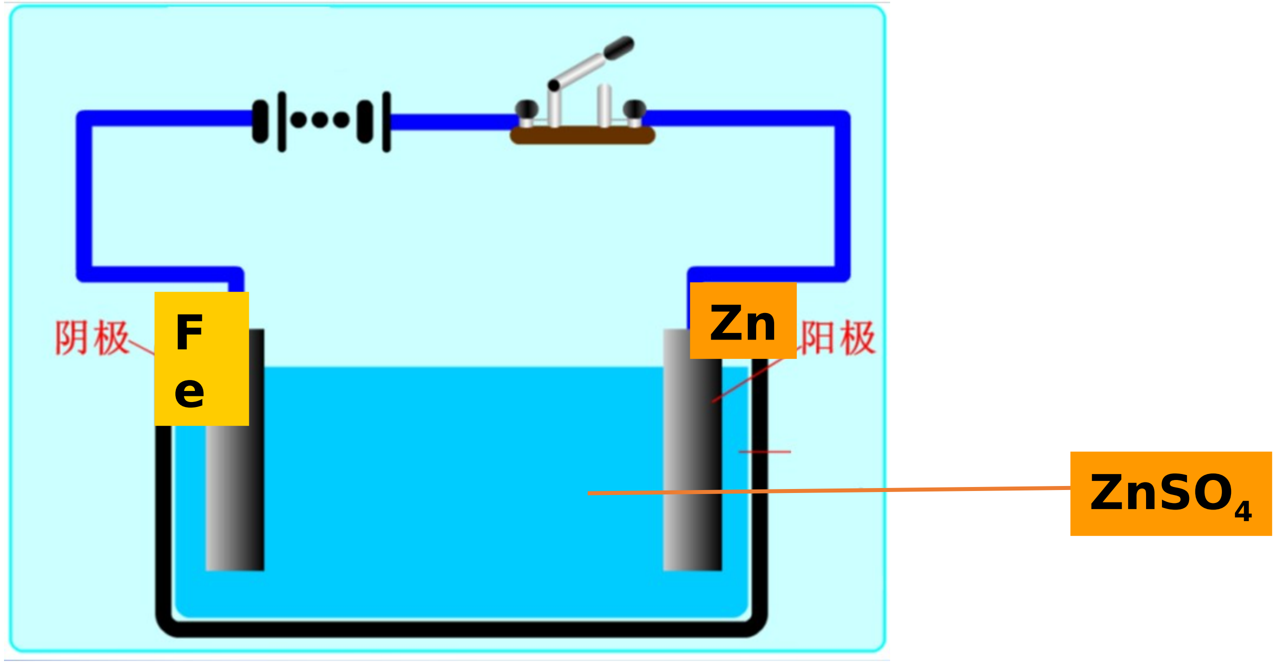
2. [illegible] $CuSO_4$ [illegible]

3



$Cu^{2+} + 2e^- = Cu$

$Cu - 2e^- = Cu^{2+}$



$$Zn^{2+} + 2e^{-} = Zn$$

$$Zn - 2e^{-} = Zn^{2+}$$

4. [illegible]

[illegible] Na Mg Al [illegible]

[illegible]:

[illegible] $6O^{2-} - 12e^{-} = 3O_2\uparrow$

[illegible] $4Al^{3+} + 12e^{-} = 4Al$

[illegible] $2Al_2O_3 \xrightarrow[\text{[illegible]}]{\text{[illegible]}} 4Al + 3O_2\uparrow$

[illegible] Na_3AlF_6 [illegible]

[illegible]: ① [illegible] $AlCl_3$?

② [illegible]

[illegible] 1 [illegible] C [illegible] D [illegible] E [illegible] F [illegible] X [illegible] Y [illegible] ([illegible]) [illegible] F [illegible]

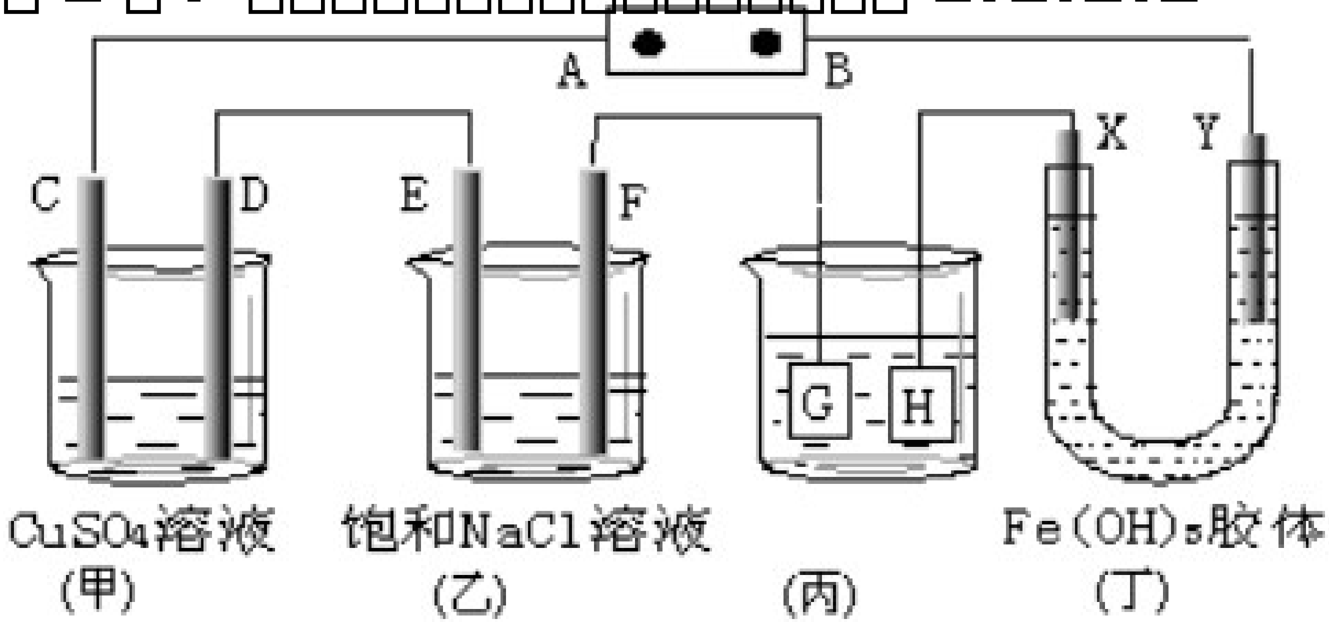
C

A. [illegible] KOH [illegible] B [illegible] O_2 [illegible] $2H_2O$ [illegible] $4e^{-}$ [illegible] $4OH^{-}$

B. [illegible] ([illegible]) [illegible] H [illegible] Ag [illegible] $AgNO_3$ [illegible]

C. [illegible] Y [illegible]

D. C [illegible] D [illegible] E [illegible] F [illegible] 1:1:2:2



2. [illegible]
[illegible] K [illegible]

[illegible] 1 [illegible]______原电池[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible] A [illegible]

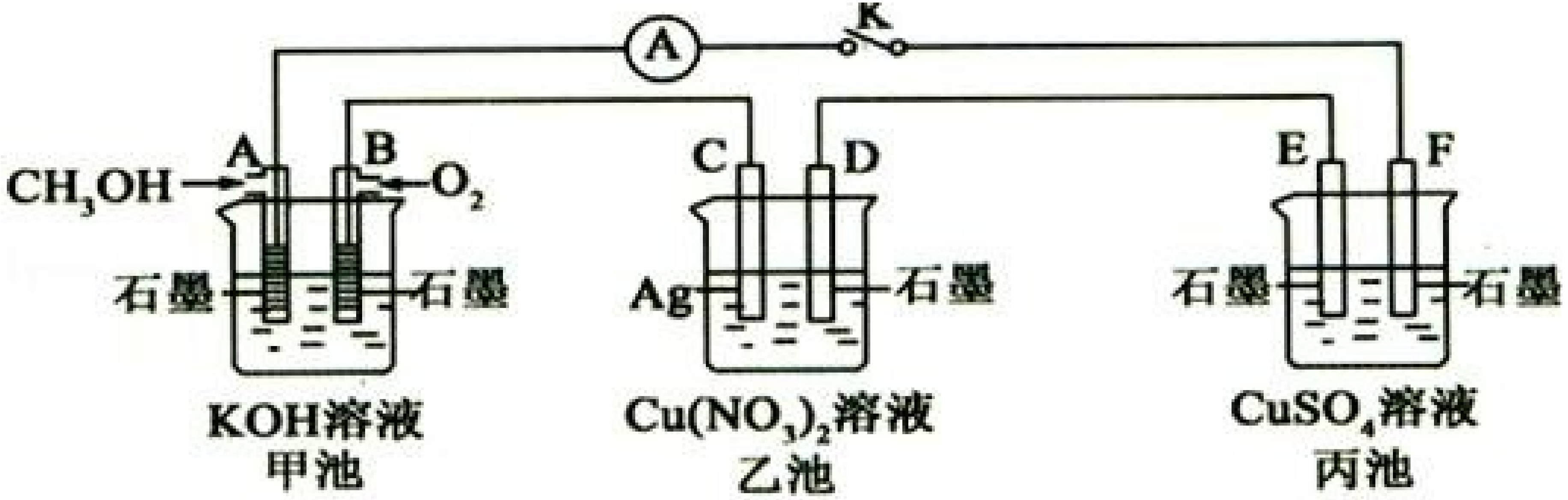
[illegible]______________[illegible]

$CH_3OH+8OH^- - 6e^- = CO_3^{2-} + 6H_2O$

[illegible] 2 [illegible] F [illegible]______ [illegible]阴极[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]______________________________[illegible]

$2CuSO_4+2H_2O \overset{电解}{=\!=\!=} 2H_2SO_4+2Cu+O_2\uparrow$



□3 □□□□□C □□□□□10.8g □□□□□B □□□□□□□O_2 □□□□

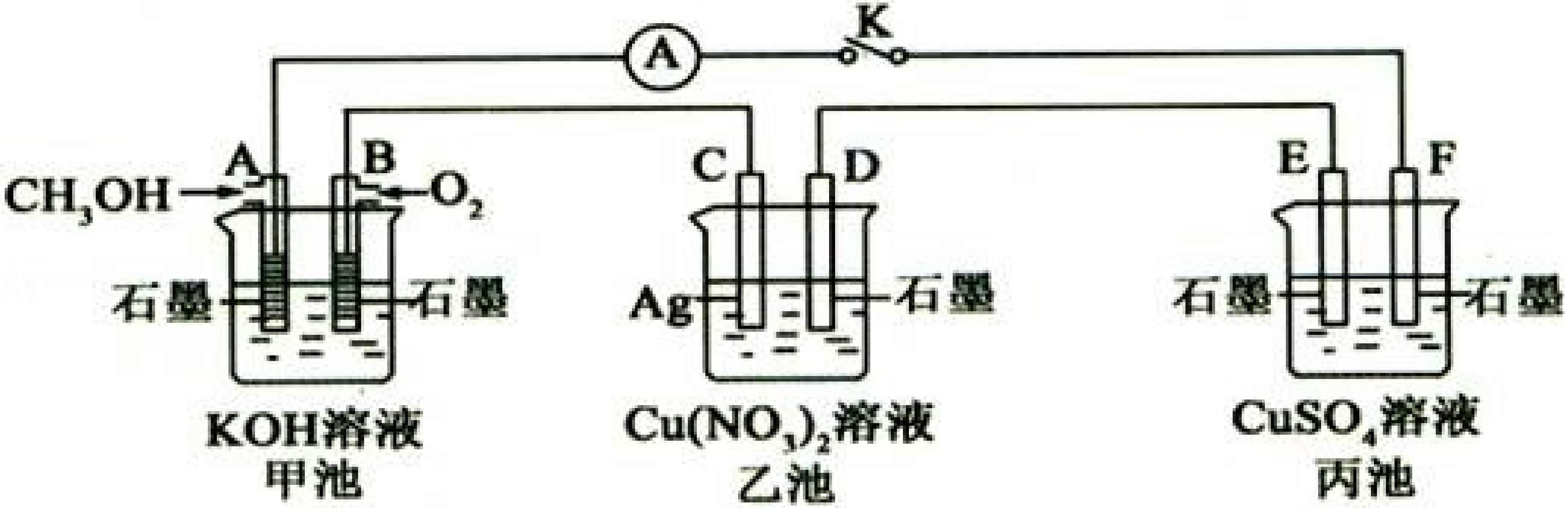
____ mL □□□□□□□ 560

□4 □□□□□□□□□□□□K □□□□□□□□□□□□□□□□□□□□____□□□

□□□□□ A

A □Cu　　　　　　B □CuO

C □Cu□OH□$_2$　　D □Cu_2□OH□$_2CO_3$



1. [illegible]

① KOH ② HNO_3

③ $AgNO_3$ ④ $MgCl_2$

2. [illegible]

NaCl $MgCl_2$ Al_2O_3

[illegible]

[illegible]

1. [illegible]

   [illegible]

2. [illegible]

   [illegible]

   [illegible]

3. [illegible]

   [illegible]

1. [illegible]

[illegible]

$$M - ne^- \rightarrow M^{n+}$$

[illegible]

- [illegible]
- [illegible]
  - [illegible]
  - [illegible]

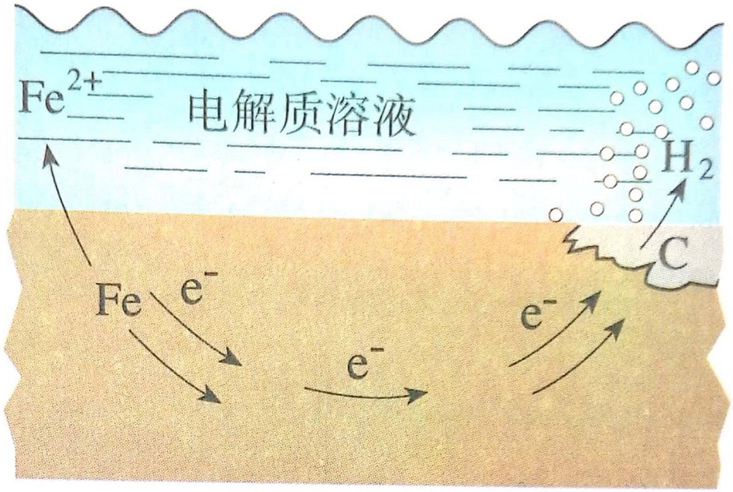


图 4-19　钢铁的析氢腐蚀示意图

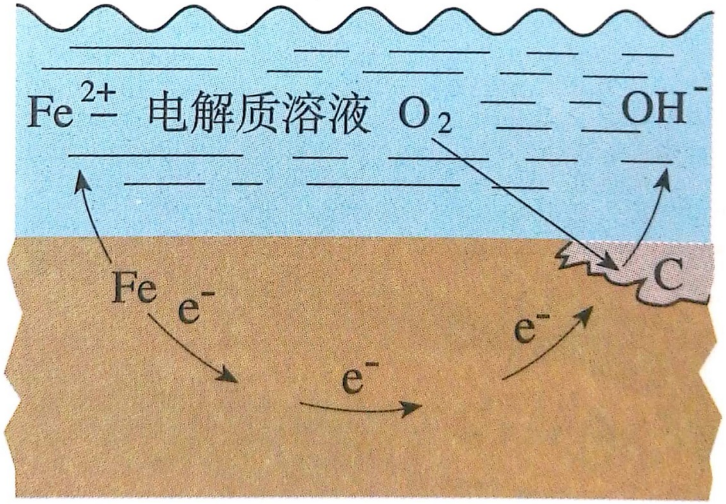


图 4-20　钢铁的吸氧腐蚀示意图

[illegible]

[illegible] U [illegible] a [illegible] b [illegible]

( )

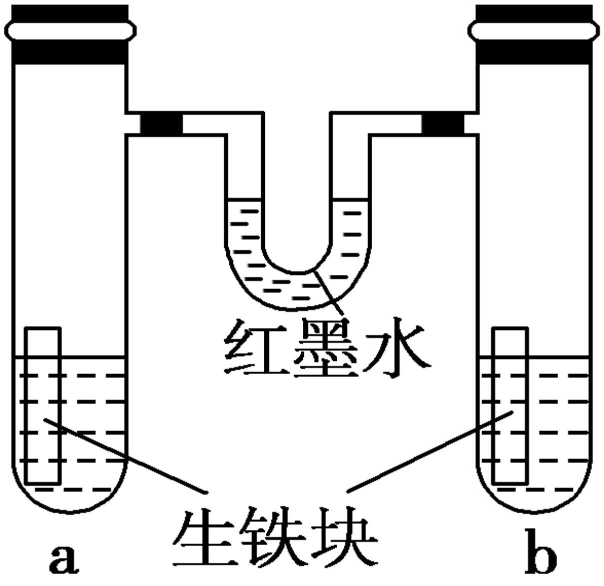
B

A [illegible]

B [illegible]

C [illegible] Fe [illegible] 2e [illegible] =Fe^{2} [illegible]

D [illegible] a [illegible] b [illegible]



[illegible]

1 . [illegible]

[illegible]

[illegible] (D)

A. [illegible]

[illegible]

B. [illegible]

$Fe-3e=Fe^{3+}$

C. [illegible]

$2H_2O+O_2+4e=4OH^-$

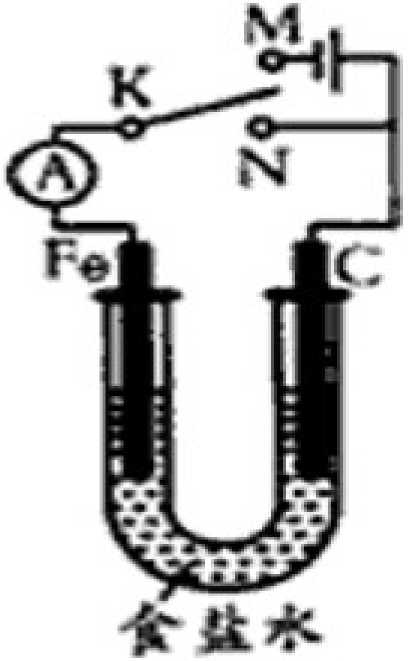
D. [illegible] 1.12g [illegible]

[illegible] 336mL [illegible]

□□□

2. □□□□□□□□□□□□□□□ 1 L 1 mol·L^{-1} □□□□□□

□□□□□□□ □ □ **D**



A □□□□ K □ N □□□□□□□□□□□□

B □□□□ K □ N □□□□□□□□□□

$4OH^{-}$ $4e^{-}=2H_2O+O_2\uparrow$

C □□□□ K □ M □□□□□□□□□□□□□

□□□□□□□□□

D □□□□ K □ M □□□□□□□□□□ 22.4 L

□□□□□□□□□□□□□□ 1 molNaOH

2. [illegible]

[illegible]

[illegible] ([illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

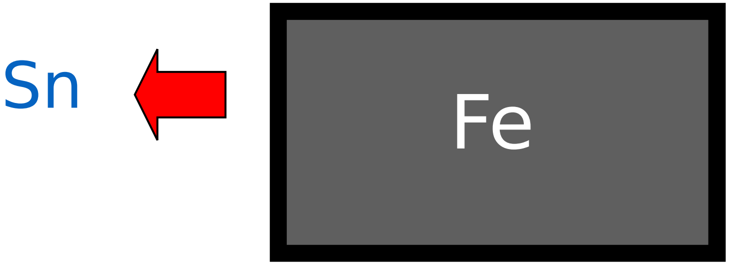
① [illegible]

② [illegible]

[illegible]

[illegible] > [illegible] > [illegible]

[illegible] > [illegible]



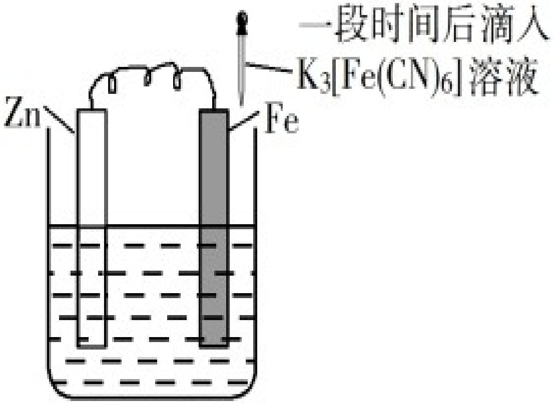
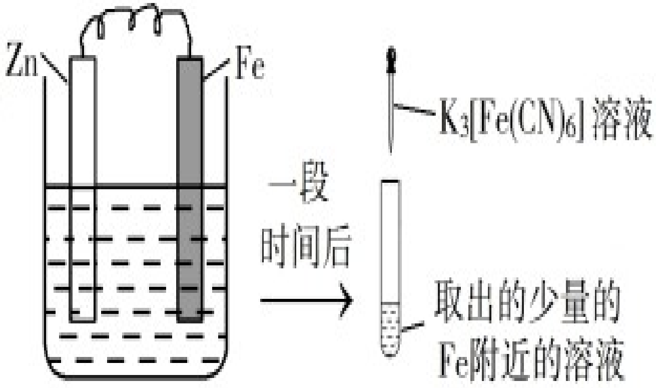
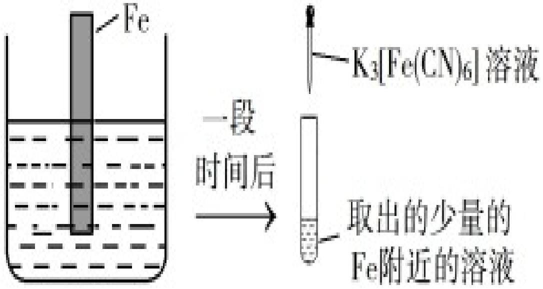
P87.

Fe^{2+} **$K_3[Fe(CN)_6]$** [**III**]

$Fe_3[Fe(CN)_6]_2$

[illegible]

[illegible] 3%NaCl [illegible]

①	②	③
		
[illegible] Fe [illegible]	[illegible]	[illegible]

[illegible] [illegible] D [illegible]

A [illegible]②③[illegible] **Zn** [illegible] **Fe**

B [illegible]①②[illegible] **$K_3[Fe(CN)_6]$** [illegible] **Fe** [illegible]

C [illegible] **Zn** [illegible] **Fe** [illegible]①[illegible]

D [illegible] **Zn** [illegible] **Cu** [illegible]①[illegible] **Fe** [illegible] **Cu** [illegible]

[illegible]

1. [illegible] (
)

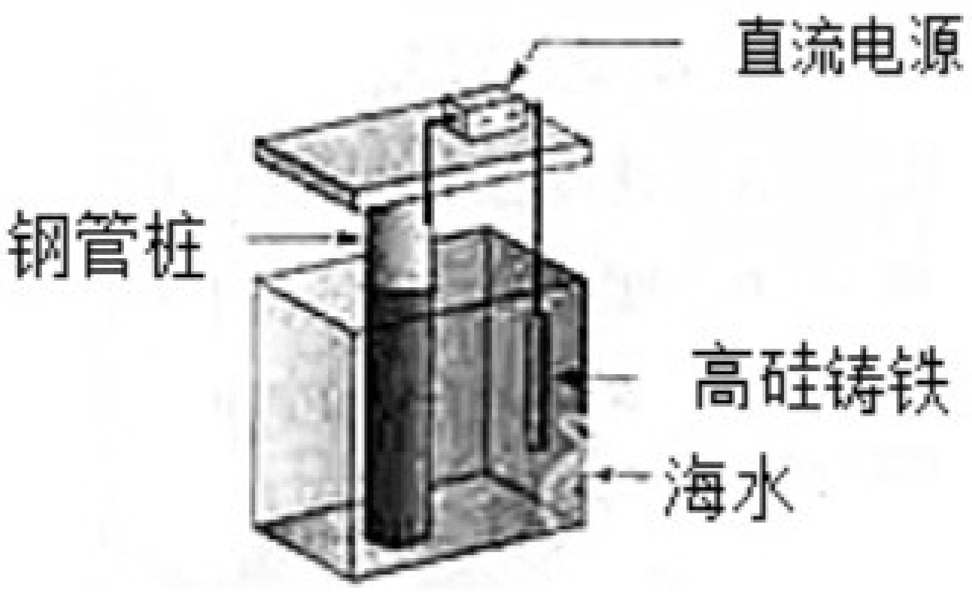
C

A. [illegible]

B. [illegible]

C. [illegible]

D. [illegible]



□□□

2. □□□□□□□□□□□□□□□（　　□　　**B**

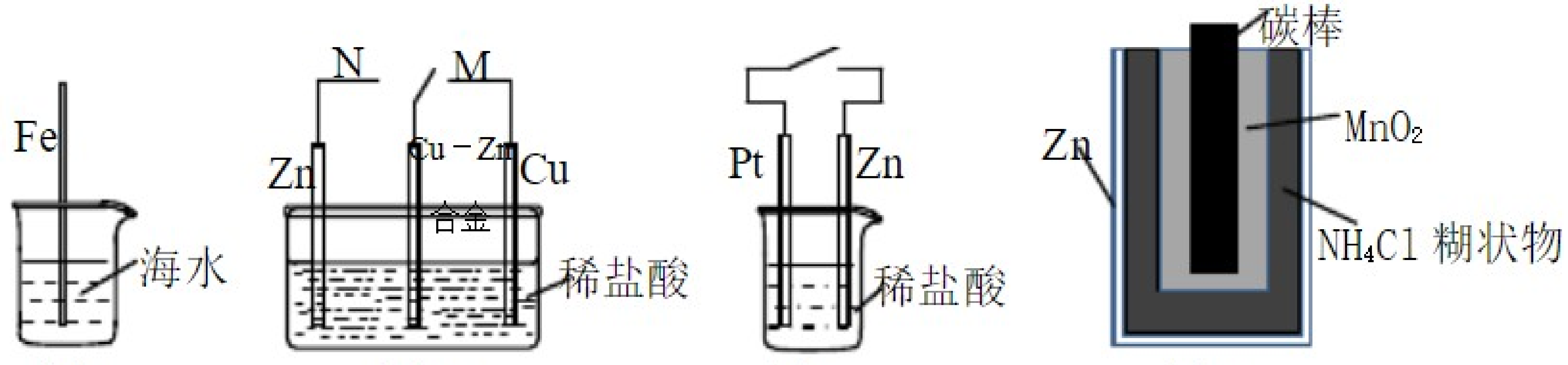


图 a　图 b　图 c　图 d

A □□ **a** □□□□□□□□□□□□□□□□□□□

B □□ **b** □□□□□ **M** □□□ **N** □□ **Cu-Zn** □□□□□□□□

C □□ **c** □□□□□□□ **Zn** □□□□□□□ **Zn** □□□□□
□□□□□

D □□ **d** □□ **Zn-MnO_2** □□□□□□□□□□□□□□ **MnO_2** □□
□□□□□□

2 □□□□ P_{76}.9 □□□ " □□□□"□□□□□□□□□□□□□

□□ H2O □ CO2 □□□ O2 □□□ (C3H8O) □□□□□□□□

□□ （ ） B

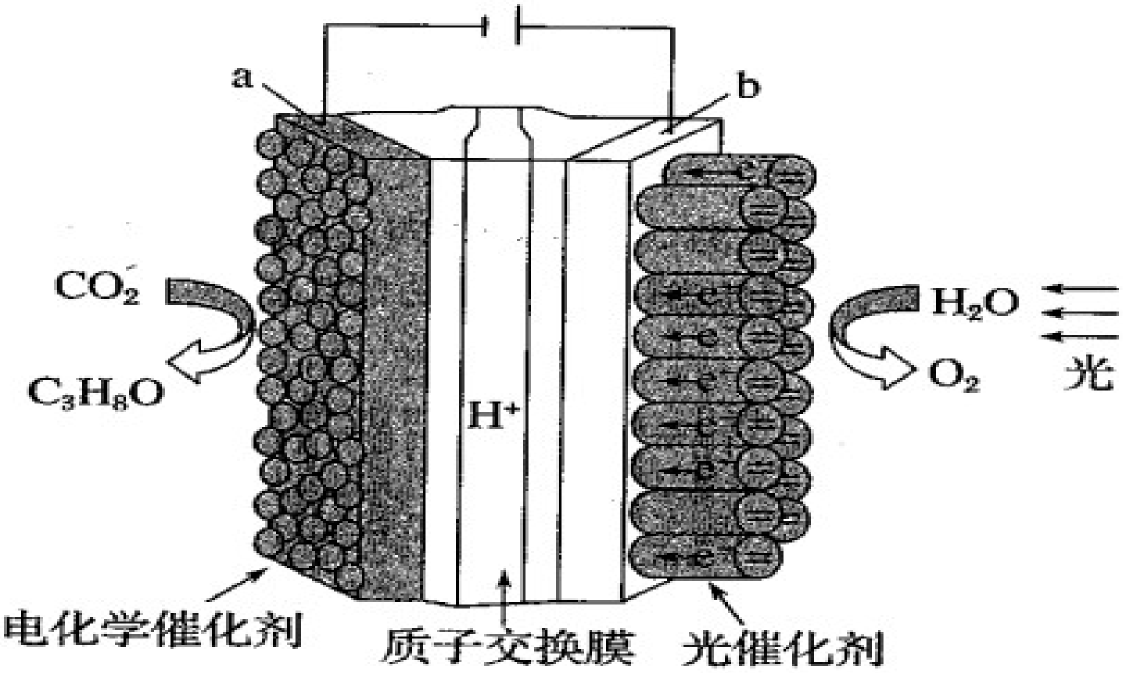
A □□□□□□□□□□□□□□□□□

B □□□□□□□□ H □□ b □□□ a □□□□

C □□□□ 1 mol O_2 □□ 44 g CO_2 □□□

D □ a □□□□□□□□ $3CO_2 + 16H$□-18e□ =

C_3H_8O+4H



3. □2014 □□ □□□. 9□

右图是在航天用高压氢镍电池基础上发展起来的一种金属氢化物镍电池(MH－Ni电池)。下列有关说法不正确 的是　C

A．放电时正极反应为：$NiOOH + H_2O + e^- \rightarrow Ni(OH)_2 + OH^-$

B．电池的电解液可为KOH溶液

C．充电时阴极反应为：$MH + OH^- \rightarrow H_2O + M + e^-$

D．MH是一类储氢材料，其氢密度越大，电池的能量密度越高

1. H_2 + 2NiO(OH) $\underset{充电}{\overset{放电}{\rightleftharpoons}}$ 2 … H)$_2$

______________ H_2+2e $2OH^-$ $=2H_2O$ ______________

______________ $NiO(OH) + e^- + H_2O == Ni(OH)_2 + OH^-$

____

2. ______________ $CH_3OCH_3 - 12\,e\text{-} + 3H_2O = 2CO_2 + 12H^+$ ______________

$CH_3OCH_3 - 12e\text{-} + 16OH^- = 2CO_3^{2-} + 11H_2O$

3. K_2FeO_4 Zn KOH

____

____

$2FeO_4^{2-} + 6e^- + 8H_2O = 2Fe(OH)_3 + 10OH^-$

____

$3Zn + 2K_2FeO_4 + 8H_2O = 3Zn(OH)_2 + 2Fe(OH)_3 + 4KOH$

4. [illegible] $Li_{1-x}CoO_2+Li_xC_6=LiCoO_2+C_6$ (x<1) [illegible] ______________________

$Li_{1-x}CoO_2+xLi^++xe^-=LiCoO_2$

__ [illegible] __ ______________________

$xLi^++C_6+xe^-=Li_xC_6$

5. [illegible] $CuSO_4$ [illegible] ________ [illegible] __

________ [illegible] __ ______________________

______________________ ① [illegible]

[illegible]“[illegible]”[illegible] 8.0g [illegible] CuO [illegible]

[illegible] ______ [illegible]

0.2mol

② [illegible] 9.8g$Cu(OH)_2$ [illegible]

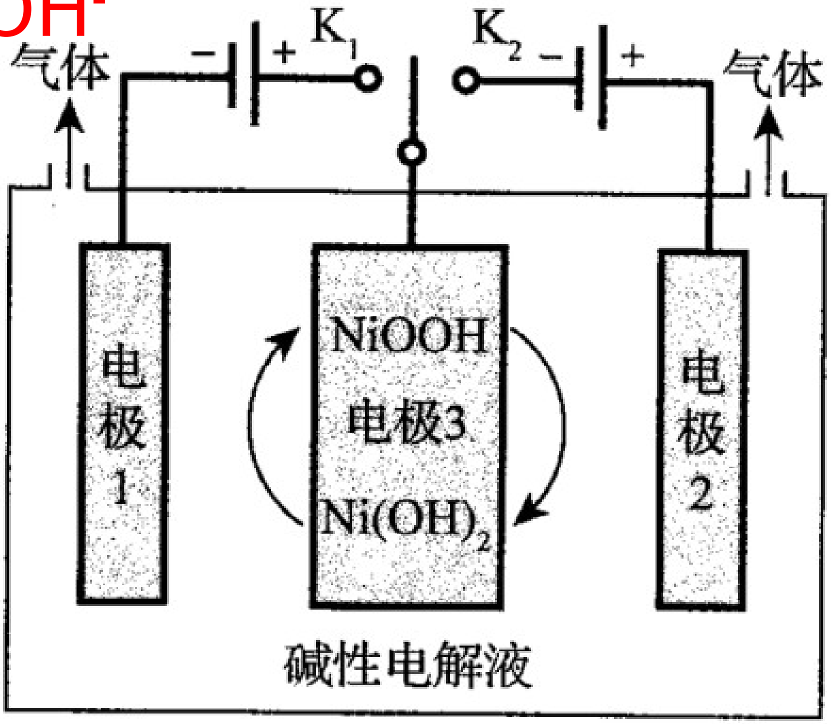
[illegible] ________ [illegible]

0.4mol

6. [illegible] K_1 [illegible] K_2 [illegible] H_2 [illegible] O_2 [illegible]

① [illegible] H_2 [illegible] ______K_1______ [illegible]

[illegible] H_2 [illegible] ______$2H_2O+2e^- = H_2\uparrow+2OH^-$______ [illegible]

② [illegible] O_2 [illegible] K_2 [illegible] 3 [illegible]

______$NiOOH+H_2O+e^- = Ni(OH)_2+OH^-$______ [illegible]